Chemical Analysis Report

WQAP-2021-01-08-02

Florida Department of Environmental Protection
Central Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **Algal Bloom Response - SE ROC**
Request ID: **RQ-2020-12-28-33**
Customer: **WQAP**
Project ID: **BLOOM-RESP**

Send Reports to:
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Fort Pierce, FL 34945
Attn: Jordan Skaggs

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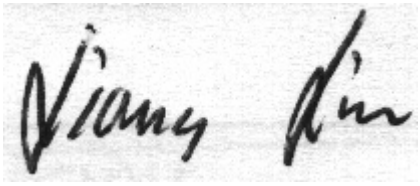
Certified by: Liang Lin, Environmental Administrator

Date Certified: 29-JAN-2021 11:27



Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Nutrients and Pesticides.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited by the Florida Department of Health Environmental Laboratory Certification Program or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

- LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
- MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
- CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
- SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
- RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
- RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
- SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

- A - Value reported is the mean of two or more determinations.
- B - Results based on colony counts outside the acceptable range.
- I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J - Estimated value and/or the analysis did not meet established quality control criteria.
- K - Actual value is known to be less than value given.
- L - Actual value is known to be greater than value given.
- N - Presumptive evidence of presence of material.
- O - Sampled, but analysis lost or not performed.
- Q - Sample held beyond normal holding time.
- T - Value reported is less than the criterion of detection.
- U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
- V - Analyte was detected in both sample and method blank.
- X - Too few individuals to calculate SCI value.
- Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: Lake Melva **Collection Date/Time: 01/07/2021 12:35**

Field ID: HAB-SE-0026 Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2217517	EPA 8321B	Anatoxin-a**	0.25	U	ug/L	P392324	
		Cylindrospermopsin**	0.25	U	ug/L	P392324	
		Desmethyl microcystin LR**	0.25	U	ug/L	P392324	
		Microcystin LA**	0.25	U	ug/L	P392324	
		Microcystin LF**	0.25	U	ug/L	P392324	
		Microcystin LR**	0.61	I	ug/L	P392324	
		Microcystin LW**	0.25	U	ug/L	P392324	
		Microcystin LY**	0.25	U	ug/L	P392324	
		Microcystin RR**	0.25	U	ug/L	P392324	
		Microcystin WR**	0.50	U	ug/L	P392324	
		Microcystin YR**	0.25	U	ug/L	P392324	
2217518	EPA 350.1 Rev. 2.0	Ammonia-N	0.020		mg N/L	P392171	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.47		mg N/L	P392763	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.034		mg N/L	P392207	
	EPA 365.1 Rev. 2.0	Total-P	0.025		mg P/L	P392395	
2217519	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.004	U	mg P/L	P392157	

Quality Assurance Report
Method Blank Results

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P392171

Component	Result	Code	Units
Ammonia-N	0.002	U	mg N/L

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P392763

Component	Result	Code	Units
Kjeldahl Nitrogen	0.080	U	mg N/L

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P392207

Component	Result	Code	Units
NO2NO3-N	0.004	U	mg N/L

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P392395

Component	Result	Code	Units
Total-P	0.002	U	mg P/L

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P392157

Component	Result	Code	Units
O-Phosphate-P	0.004	U	mg P/L

Reference Method: EPA 8321B
Batch ID: P392324

Component	Result	Code	Units
Anatoxin-a	0.25	U	ug/L
Cylindrospermopsin	0.25	U	ug/L
Desmethyl microcystin LR	0.25	U	ug/L
Microcystin LA	0.25	U	ug/L
Microcystin LF	0.25	U	ug/L
Microcystin LR	0.25	U	ug/L
Microcystin LW	0.25	U	ug/L
Microcystin LY	0.25	U	ug/L
Microcystin RR	0.25	U	ug/L
Microcystin WR	0.50	U	ug/L
Microcystin YR	0.25	U	ug/L

Quality Assurance Report
Laboratory Control Sample Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P392171

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	99.0		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P392763

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	101		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P392207

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	99.5		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P392395

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	103		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P392157

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	97.8		P	90 - 110

Reference Method: EPA 8321B
Batch ID: P392324

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Anatoxin-a	118		P	40 - 150
Cylindrospermopsin	90.6		P	40 - 150
Desmethyl microcystin LR	121		P	40 - 150
Microcystin LA	142		P	40 - 150
Microcystin LF	148		P	40 - 150
Microcystin LR	90.3		P	40 - 150
Microcystin LW	137		P	40 - 150
Microcystin LY	136		P	40 - 150
Microcystin RR	108		P	40 - 150
Microcystin WR	117		P	40 - 150
Microcystin YR	99.0		P	40 - 150

Quality Assurance Report
Matrix Spike Accuracy

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P392171

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2217474	Ammonia-N	101	97.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P392763

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2217203	Kjeldahl Nitrogen	98.2	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P392207

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2217474	NO2NO3-N	98.5	98.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P392395

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2217358	Total-P	102	100	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P392157

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2217483	O-Phosphate-P	97.9	98.1	P/P	90 - 110

Reference Method: EPA 8321B
Batch ID: P392324

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2217473	Anatoxin-a	98.5	106	P/P	40 - 150
2217473	Cylindrospermopsin	82.4	94.5	P/P	40 - 150
2217473	Desmethyl microcystin LR	110	114	P/P	40 - 150
2217473	Microcystin LA	123	115	P/P	40 - 150
2217473	Microcystin LF	111	114	P/P	40 - 150
2217473	Microcystin LR	96.6	94.2	P/P	40 - 150
2217473	Microcystin LW	113	117	P/P	40 - 150
2217473	Microcystin LY	122	119	P/P	40 - 150
2217473	Microcystin RR	92.5	100	P/P	40 - 150
2217473	Microcystin WR	103	102	P/P	40 - 150
2217473	Microcystin YR	93.9	104	P/P	40 - 150

Quality Assurance Report
Precision

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P392171

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2217474	Ammonia-N	1.82	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P392763

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2217203	Kjeldahl Nitrogen	1.97	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P392207

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2217474	NO2NO3-N	0.432	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P392395

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2217358	Total-P	1.24	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P392157

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2217483	O-Phosphate-P	0.204	Spike	P	0 - 20

Reference Method: EPA 8321B
Batch ID: P392324

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2217473	Anatoxin-a	7.59	Spike	P	0 - 30
2217473	Cylindrospermopsin	13.7	Spike	P	0 - 30
2217473	Desmethyl microcystin LR	3.26	Spike	P	0 - 30
2217473	Microcystin LA	6.11	Spike	P	0 - 30
2217473	Microcystin LF	2.96	Spike	P	0 - 30
2217473	Microcystin LR	2.34	Spike	P	0 - 30
2217473	Microcystin LW	3.73	Spike	P	0 - 30
2217473	Microcystin LY	2.46	Spike	P	0 - 30
2217473	Microcystin RR	7.84	Spike	P	0 - 30
2217473	Microcystin WR	0.335	Spike	P	0 - 30
2217473	Microcystin YR	10.1	Spike	P	0 - 30

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report
Surrogates

Lab Sample ID: 2217517
Field Sample ID: HAB-SE-0026

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
EPA 8321B	Microcystin LR-d7	73.4	P	30 - 160
EPA 8321B	Microcystin LR ethyl-d5	69.0	P	30 - 160

Quality Assurance Report
Calibration Verification

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Run ID: A102966
Included Lab Sample IDs: 2217519

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.3	98.8	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Run ID: A102971
Included Lab Sample IDs: 2217518

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	98.6	97.8	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Run ID: A102983
Included Lab Sample IDs: 2217518

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	99.0	99.0	P/P	90 - 110

Reference Method: EPA 8321B
Run ID: A103058
Included Lab Sample IDs: 2217517

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Anatoxin-a	115	121	P/P	50 - 160
Cylindrospermopsin	97.4	92.7	P/P	60 - 160
Desmethyl microcystin LR	121	123	P/P	60 - 160
Microcystin LA	140	122	P/P	50 - 160
Microcystin LF	145	122	P/P	60 - 160
Microcystin LR	102	94.2	P/P	60 - 160
Microcystin LW	141	116	P/P	60 - 160
Microcystin LY	147	138	P/P	60 - 160
Microcystin RR	106	114	P/P	60 - 160
Microcystin WR	111	111	P/P	60 - 160
Microcystin YR	106	99.9	P/P	60 - 160

Reference Method: EPA 365.1 Rev. 2.0
Run ID: A103081
Included Lab Sample IDs: 2217518

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	96.2	98.0	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Run ID: A103216
Included Lab Sample IDs: 2217518

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	93.1	95.9	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.
Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.
Where they are different, both control limits are provided.

Quality Assurance Report
Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision		
					LCS	SMP	MS
EPA 350.1 Rev. 2.0	Ammonia-N	99.0	101	97.8			1.82
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	101	98.2	102			1.97
EPA 353.2 Rev. 2.0	NO2NO3-N	99.5	98.5	98.0			0.432
EPA 365.1 Rev. 2.0	Total-P	103	102	100			1.24
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	97.8	97.9	98.1			0.204
EPA 8321B	Anatoxin-a	118	98.5	106			7.59
	Cylindrospermopsin	90.6	82.4	94.5			13.7
	Desmethyl microcystin LR	121	110	114			3.26
	Microcystin LA	142	123	115			6.11
	Microcystin LF	148	111	114			2.96
	Microcystin LR	90.3	96.6	94.2			2.34
	Microcystin LW	137	113	117			3.73
	Microcystin LY	136	122	119			2.46
	Microcystin RR	108	92.5	100			7.84
	Microcystin WR	117	103	102			0.335
	Microcystin YR	99.0	93.9	104			10.1

Reference Method Descriptions

Method	Description	Associated Samples
EPA 350.1 Rev. 2.0	Ammonia in aqueous matrices as mg N/L	2217518
EPA 351.2 Rev. 2.0	Total Kjeldahl Nitrogen in aqueous matrices	2217518
EPA 353.2 Rev. 2.0	Nitrite/Nitrate in aqueous matrices as mg N/L	2217518
EPA 365.1 Rev. 2.0	Total Phosphorus in aqueous matrices as mg P/L	2217518
EPA 365.1 Rev. 2.0 dissolved	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2217519
EPA 8321B	Microcystins in water matrices by HPLC/MS/MS	2217517

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 350.1 Rev. 2.0	01/08/2021			01/10/2021 12:35	Ping Hua	2217518
EPA 351.2 Rev. 2.0	01/08/2021	01/22/2021 13:22	Yen Ta	01/25/2021 13:11	Julia Storbeck	2217518
EPA 353.2 Rev. 2.0	01/08/2021			01/11/2021 10:37	Beverly Y. Sanders	2217518
EPA 365.1 Rev. 2.0	01/08/2021	01/14/2021 14:05	Shengyu Wang	01/15/2021 12:48	Shengyu Wang	2217518
EPA 365.1 Rev. 2.0 dissolved	01/08/2021			01/08/2021 15:56	Ping Hua	2217519
EPA 8321B	01/08/2021	01/14/2021 07:00	Pramila Ghimire	01/14/2021 09:44	Pramila Ghimire	2217517